ANNUAL REPORT ON THE IMPLEMENTATION OF THE STATE GOVERNMENT ENERGY CONSERVATION ACT, SECTION 48-52-620, CODE OF LAWS OF SOUTH CAROLINA

Prepared by the South Carolina Energy Office
Submitted to the South Carolina General Assembly
December 31, 2014

This document may be downloaded from the South Carolina Energy Office website:

http://energy.sc.gov/public

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The South Carolina Energy Office (SCEO) submits this report in accordance with Section 48-52-620 (E), Code of Laws of South Carolina.

I. Background

A. Section 48-52-620, Code of Laws of South Carolina

Section 48-52-620, Code of Laws of South Carolina, requires all state agencies, school districts and public colleges and universities to develop energy conservation plans to reduce their energy consumption intensity by one percent annually during fiscal years 2009-2013 and by a total of 20 percent by 2020, as compared to 2000 levels.

The specific requirements of this legislation include the following:

- Energy Conservation Plans – Each public entity is required to develop an energy conservation plan that addresses how the legislatively mandated energy use goals are to be met. These plans are to be submitted to the SCEO.
- Annual Progress Reports – Each public entity is also required to submit an annual progress report to the SCEO that outlines actions taken to implement its energy conservation plan and chronicles progress made in achieving its energy use goals.
- Annual Report to Legislature – The SCEO is required to compile the annual progress reports submitted by the public entities and submit an overall annual report to the General Assembly.

B. South Carolina Energy Office

The 1992 South Carolina Energy Conservation and Efficiency Act established the SCEO within the State Budget and Control Board in order to address energy issues in a consistent and professional manner. The SCEO carries out the state policy and program mandates of the Act and also administers the State Energy Program funded by the United States Department of Energy. Additionally, we carry out substantial functions related to radioactive waste disposal mandated by legislation passed by the General Assembly in 2000. The mission of the SCEO is to increase energy efficiency, enhance environmental quality and save energy dollars for South Carolina.

II. South Carolina Energy Office – Initial Implementation Activities

A. SCEO Implementation Plan

In an effort to ensure the development of a fair and equitable methodology for implementing this legislative requirement, in 2008 the SCEO established an advisory group of knowledgeable representatives from a variety of state agencies, school districts, colleges and universities and technical schools – all of

which were affected by the new legislative mandate. The composition of this group reflected the diversity of entities affected by this legislation, from size to type of institution.

B. Plan Development Workshops

Based on the advisory group's suggestions, SCEO offered a total of four Energy Plan Development Workshops around the state. A total of 147 people participated in these workshops, representing 17 public colleges and universities, 20 state agencies and 49 school districts.

SCEO made additional energy plan development training possible through various workshops and conferences during which staff discussed the legislation and offered practical guidance on energy plan development. A total of 101 public entities sought some form of training through the SCEO Energy Plan Development Workshops and similar events. Additionally, SCEO staff offered extensive one-on-one training.

Following the workshops, SCEO staff developed a Sample Energy Conservation Plan Template which remains available to state agencies from our website.

C. South Carolina Accredited Commercial Energy Manager Training (ACEM)

In 2009, the SCEO and the Association of South Carolina Energy Managers created a state-specific alternative to the national Certified Energy Manager training offered in years past. While the South Carolina Accredited Commercial Energy Manager Training has provided hands-on information to a broad range of participants, its primary purpose is to train facility and energy managers to reduce energy consumption in support of the new legislative requirements. The course focuses on teaching participants to identify projects to reduce their energy consumption and to calculate their projected energy savings.

Since the first of these trainings was offered in July of 2009, a total of 13 ACEM training classes have been held, two of which occurred during FY 2014. A total of 235 individuals have received this extensive energy management training. The pass rate for this course averages approximately 83%, with those passing the test earning ACEM certification.

In response to requests from ACEM graduates, we instituted a one-day "graduate seminar" in 2011, which has been repeated in subsequent years. To date eight graduate classes have been offered, with a total attendance of 121. This refresher seminar does not include a final test.

III. South Carolina Energy Office – 2014 Activities

A. Assistance to Agencies

The SCEO staff works with those agencies requesting assistance with their reporting requirements, and often devotes considerable effort to identify and correct reporting errors. SCEO invites reporting using the mechanism most convenient to the agency. This may range from elaborate facility and energy management software to the free US EPA Portfolio Manager program or to a simple reporting spreadsheet developed by SCEO. Assistance is available to help reporting entities move their data into Portfolio Manager to assist with long-term benchmarking, national benchmarking, and/or applications for ENERGY STAR® designations for individual buildings.

B. Technical Assistance Program (TAP)

The SCEO has developed a Technical Assistance Program (TAP) currently focused on the large percentage of state buildings managed by the Office of General Services. The program will soon be available statewide to all government offices and will assist occupants and owners with identifying opportunities to save energy. TAP services will include utility bill analysis, energy assessments and building walkthroughs. The program will generate a report recommending energy measures and estimated cost savings which can be used to establish an implementation plan. Special requests for reviews of non-profit-owned buildings and other types of energy technical assistance will also be considered based on demand and staff availability.

C. ConserFund

ConserFund is a low-interest loan program for energy efficiency improvements in state agencies, public colleges or universities, school districts, local governments and private non-profit organizations. The fixed annual interest rate is currently set at 2%. ConserFund is structured so that the cost savings resulting from the energy efficiency upgrades funded through this program are applied to the loan payments.

There continues to be strong interest in energy efficiency sparked by ARRA activities, along with an aggressive marketing effort, which has resulted in a significant number of successful ConserFund revolving loan applications in FY13 (10) and FY14 (6).

Since its inception, the ConserFund Loan Program has made the following loans:

ConserFund Loan Summary FY2000 – FY2014

School Districts	15
State Agencies	16
Public Colleges & Universities	10
Private Non-profits	17
Local Governments	10
Total # of Loans	68

In early 2015, we will launch ConserFund Plus, available only to state agencies, public colleges and universities and public K-12 schools. ConserFund Plus will be funded through ARRA funds that were initially distributed to state entities as 0% interest loans, which have subsequently been repaid. These funds will continue to support energy efficiency in state buildings by circulating as a revolving loan with a 30% grant component that will not need to be repaid. Because the funds originated with the American Recovery and Reinvestment Act (ARRA), borrowers will need to comply with all aspects of ARRA, especially *Buy American* provisions and Davis Bacon wage reporting requirements. Loan decisions will be made quarterly.

D. Energy Performance Contracting and Agency Assistance

Energy Performance Contracts (EPCs) offer another way for agencies and schools to fund efficiency improvements. EPCs are turn-key services provided by an energy services company (ESCO). The ESCO identifies a set of energy-saving opportunities and recommends a package of improvements to be paid for through savings. Savings are often guaranteed so that if they do not materialize, the ESCO will pay the difference.

SCEO conducted two performance contracting workshops, one in FY13 (December, 2012) and one in FY14 (February, 2014) to familiarize government entities with performance contracting. Approximately 75 ESCOs and public agencies attended the first meeting. A follow-up questionnaire indicated the vast majority of participants would like to see an on-going organization devoted to energy performance contracting, and that they felt the need for assistance with determining how to proceed with retrofits. Accordingly, SCEO created a steering committee of public agencies and ESCOs to guide the activities of a performance contracting interest group, and sought funding to provide additional assistance to agencies. (See below.)

E. Palmetto Energy Efficient Retrofits (PEER)

The SCEO earned a two-year U.S. Department of Energy (DOE) State Energy Program Competitive grant to assist agencies with energy efficiency retrofits, strengthen performance contracting stakeholder groups and improve the required performance contracting documentation.

This program, called Palmetto Energy Efficient Retrofits (PEER), allows SCEO to provide needs assessment assistance to state agencies, school districts and public colleges and universities. This is expected to promote interest in performance contracts and SCEO loan programs. Outreach began in the fall of 2014 and, to date, four agencies have received site assessments and another seven are in process.

F. Milestone Recognition Awards

A grant from the Emily Hall Tremaine Foundation has allowed SCEO to provide tangible recognition for those agencies, school districts and public colleges and universities that appear to have met their mandated 20% energy use reduction since the year 2000.

(A*t left, a representative from Greenville Technical College receives an award from SCEO Director Ashlie Lancaster and Tremaine Foundation's Nicole Chevalier.)*

The agencies listed below received Milestone Recognition Awards for meeting the 20% energy use reduction goal. (Note that recognition does not ensure that an agency's energy use will not rise at some point in the future.)

Aiken Technical College
Barnwell School District 45
Beaufort School District
The Citadel
Frances Marion University
Greenville School District
Greenville Technical College
Clarendon School District 1
Clover School District (York SD2)
Coastal Carolina University
Colleton County School District
Darlington School District
Georgetown School District
Greenwood School District 50
Lancaster School District
Laurens School District 55
The Military Department
Newberry County School District
Northeastern Technical College
Patriots Point Development Authority
Piedmont Technical College
Rock Hill School District 3
SC Department of Corrections
SC Department of Disabilities & Special Needs

SC Department of Employment and Workforce
SC Department of Health & Environmental Control
SC Department of Natural Resources
SC Department of Parks, Recreation & Tourism
SC Department of Public Safety
SC Division of General Services
SC ETV
SC Forestry Commission
SC Law Enforcement Division
Spartanburg Community College
Sumter School District
Tri-County Technical College
USC Columbia
USC – Upstate
Williamsburg School District
Williamsburg Technical College
Winthrop University
York County School District 1

The Foundation also provides funding to document and publicize energy efficiency successes among the state's public schools receiving ARRA funding. Examples of success story summaries are included in Appendix A.

IV. Submission of Annual Progress Reports

During 2014, public entities subject to the Energy Conservation Act were required to complete the following five sections of the report:

Section 1: Energy Conservation Measures
This section required the listing of energy conservation measures implemented during the year, including any measured or projected energy savings.

Section 2: Energy Consumption Data
In this section, overall energy consumption data was reported, either through a web-based reporting tool or a spreadsheet provided by SCEO.

Section 3: Energy Team Development
This section requested an update on the organization's energy team, including any change in membership or any training, education or other energy team activities that occurred during the year.

Section 4: Purchase of Energy Conservation Products
This section requested a disclaimer that all purchased energy conservation products have been certified and/or approved by the SCEO, as per §48-52-640.

Section 5: Energy Retrofit Financing
This section solicited information about current and past performance contracts, as well as assessed interest in the ConserFund loan program.

Section 6: Additional Narrative
This section allowed for a brief summary of any changes that may have occurred since submission of the Energy Conservation Plan to the SCEO, as well as any successes deserving mention or any barriers encountered.

At the time this annual report was written, 85% of the state's public entities submitted complete reports, with valid information provided for all categories. An additional 12 percent submitted partially complete reports. Three percent failed to submit any reports at all[1].

Organization Type	Total Number of Entities	Complete	% Complete	Partially Complete	% Partially Complete	Non-Submitting	% Non-Submitting
State Agencies	33	31	94%	2	6%	0	0%
Research/Residential Colleges and Universities	12	12	100%	0	0%	0	0%
Non-Residential Colleges and Universities	21	21	100%	0	0%	0	0%
School Districts	81	61	75%	15	20%	5	6%
Totals	147	125	85%	17	12%	5	3%

A list of partially complete and non-submitting entities is included in Appendix B. As in prior years, many entities were able to prepare and submit their reports with little or no help, while others required in-depth assistance. SCEO staff continues to offer ongoing assistance to those entities which did not provide complete reports.

A selection of several fully completed Annual Progress Reports is attached in Appendix C. These reports are included to illustrate the types of energy conservation measures being undertaken by many of the state's agencies, school districts and public colleges and universities. Note that this attachment is merely a sampling of complete reports and is not intended to imply SCEO endorsement of these reports over those not included here.

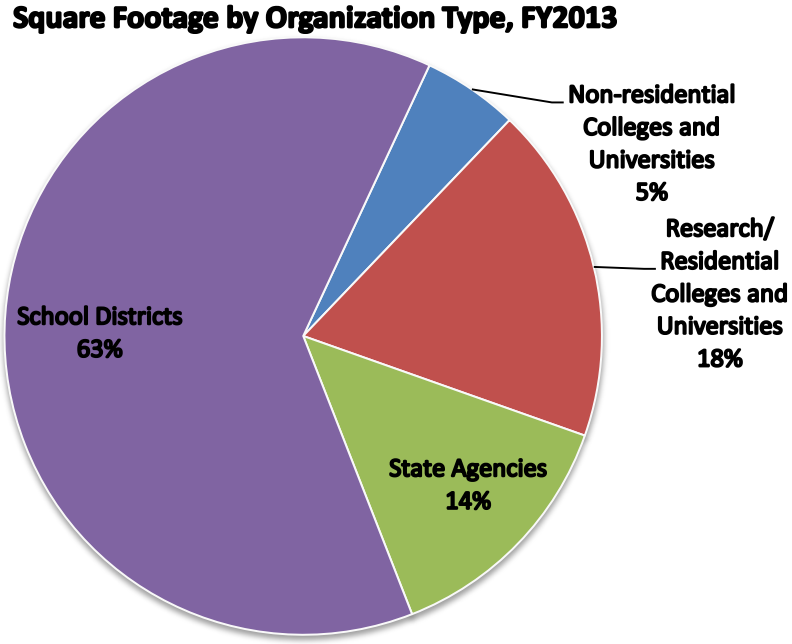
V. Progress toward Energy Conservation Goals

The SC Government Energy Conservation and Efficiency Act requires public entities to work toward meeting specific goals in reducing their energy intensity (defined as total site energy consumption per gross square foot). The SCEO has collected data on energy consumption, energy spending, and building square footage from public entities on an annual basis for the past 20 years. These data

[1] Please note that these percentages may not total to 100% due to independent rounding.

can be used as a basis for estimating the progress made by public entities toward meeting their energy goals. However, these data are accepted as received, and the SCEO can make no representation regarding their accuracy. In addition, some entities did not submit reports to the SCEO, introducing a potential source of bias. Consequently, the statistics reported in this section should be approached with caution. The SCEO continues to provide assistance to public entities which need help establishing systems for tracking energy usage.

School districts were responsible for the majority of reported building space, constituting 63% of the square footage reported by public entities. Research/Residential colleges and universities are the next largest category, reporting 18% of the total square footage. State agencies (14%) and non-residential colleges and universities (5%) account for the smallest categories of reporting entities.

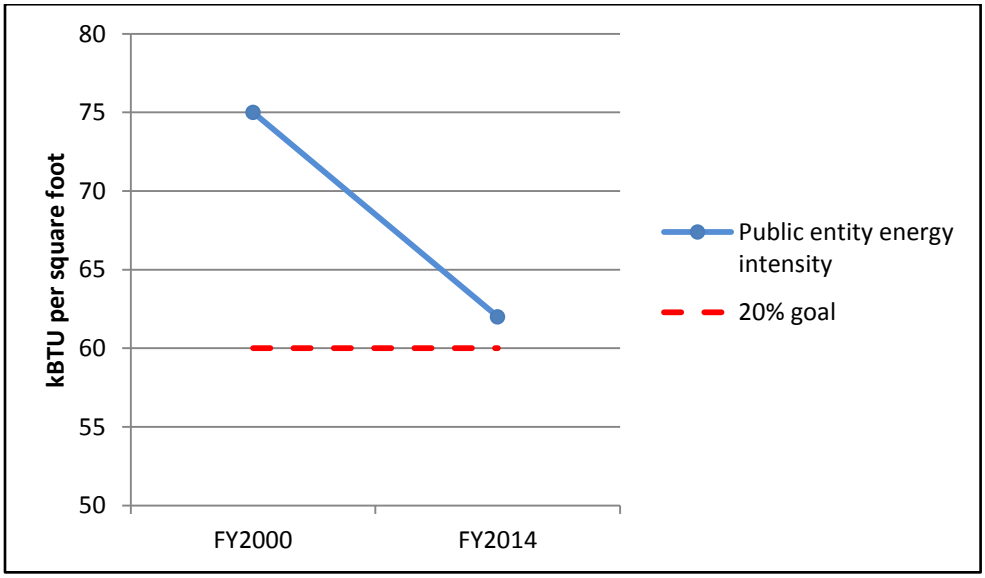


Data submitted for the most recent fiscal year (FY2014) indicate that public entities decreased their energy intensity by an average of 17% compared to the FY2000 baseline. School districts—the least energy-intensive category of public entities—reported improvements of 11%. Research/Residential colleges—the most energy-intensive category—reported improvements of 17%.

Unfortunately, although reporting entities were able to reduce their use per square foot, energy spending per square foot (as reported and adjusted for inflation) increased an average of 4% during this period.

Organization Type	Average Energy Use per Square Foot (site kBTU)			Average Energy Spending per Square Foot ($)		
	FY2000	FY2014	% change	FY2000	FY2014	% change
State Agencies	113	85	-25%	$1.83	$1.79	-2%
Residential Colleges and Universities	143	119	-17%	$1.79	$2.00	+12%
Non-Residential Colleges and Universities	80	64	-20%	$1.60	$1.59	-1%
School Districts	45	40	-11%	$1.15	$1.18	+3%
Total	**75**	**62**	**-17%**	**$1.39**	**$1.44**	**+4%**
Note: These statistics are based on self-reported data submitted by public entities. SCEO makes no representation regarding the accuracy of these data. Dollars adjusted using the Consumer Price Index-Urban, BLS (data.bls.gov)						

In aggregate, the state's public sector has reported significant improvements in energy intensity based on 2000 versus 2014 energy usage.



State Organization Energy Usage	
Year	**kBtu per ft^2**
2014	62
2000	75
20% reduction goal will be met when kBtu/ft^2 value is less than or equal to 60.	
These statistics are based on data submitted by public entities. SCEO makes no representation regarding the accuracy of these data.	

Public entities in South Carolina have almost met, as a whole, the 20% goal set by the Energy Conservation and Efficiency Act. Compared to 2013 (which also showed a 17% reduction in consumption), 2014 saw increased energy usage by Research/Residential Colleges and Universities and School Districts with no change in use by Non-Residential Colleges and Universities. These factors contributed to holding the state's usage at the same level as the previous year. Although energy savings are being realized, 2015 will provide an opportunity to once again meet the goal of 20% reduction. As always, the Energy Office is only able to report on the data submitted by state entities. Partially complete or missing data also affects the savings metrics and can lead to difficulty in year-by-year comparisons of energy use.

VI. Conclusion

The purpose of this report is to provide the South Carolina General Assembly with an update on implementation of requirements of the 2008 Energy Conservation and Efficiency Act (Section 48-52-620, Code of Laws of South Carolina).

Through the development and implementation of Energy Conservation Plans, as required by this legislation, the state's public entities have developed strategies for meeting energy conservation goals. Annual Progress Reports submitted by many of these organizations identify specific and measureable energy conservation efforts they are undertaking. Finally, the SCEO, through several ongoing and new programs, provides training, technical assistance and funding to these entities for the purpose of assisting them to make progress toward their energy conservation goals.

Appendix A:

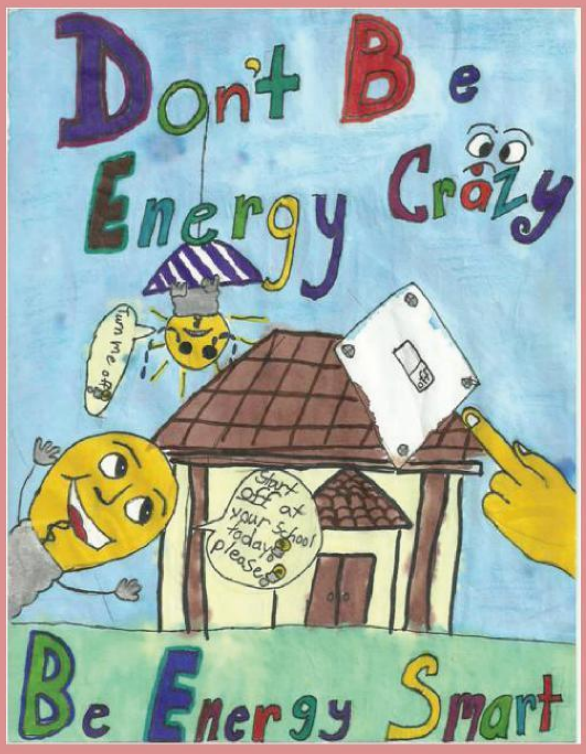
Sample Success Stories

South Carolina School Success Stories

Behavioral Modification

Installing energy efficient equipment is a great way to save money on energy costs but even more money can be saved through energy conservation. Energy savings can be achieved through school faculty, staff, and students becoming more conscious about energy usage. Districts need to start by establishing and implementing a comprehensive energy policy with procedures. Using a utility accounting and energy management information system to measure, track, and analyze over 300 power, gas, and water bills each month can help spot wasted use and costs. In addition, working with utility providers to ensure the best rates, most consistent and most efficient service possible, and proper billing cycles can also bring costs down. Remember to check with your local utility to see if additional rebates are available.

Various schools are educating their employees and students on how to better use energy and providing feedback of how their actions are benefitting the school district. See project examples below and on the back of this handout.



Rock Hill Schools

The Rock Hill School District instituted a number of programs to encourage students and faculty to conserve energy:

- Held contests between faculty and staff to see who could conserve the most energy.
- Trained teachers, administrators, office staff, cafeteria, coaches, custodians and other staff on the latest conservation techniques. They also expanded the training to all those who use the facilities.
- Worked to continuously identify and resolve problems before they occur to make buildings more comfortable and efficient.
- Consistently communicated to administrators on ways to improve the learning environment and save wasted costs.
- Clearly showed progress and encouraged commitment through reports, developing new resources and incentives for savings.
- Held a student energy conservation art contest.

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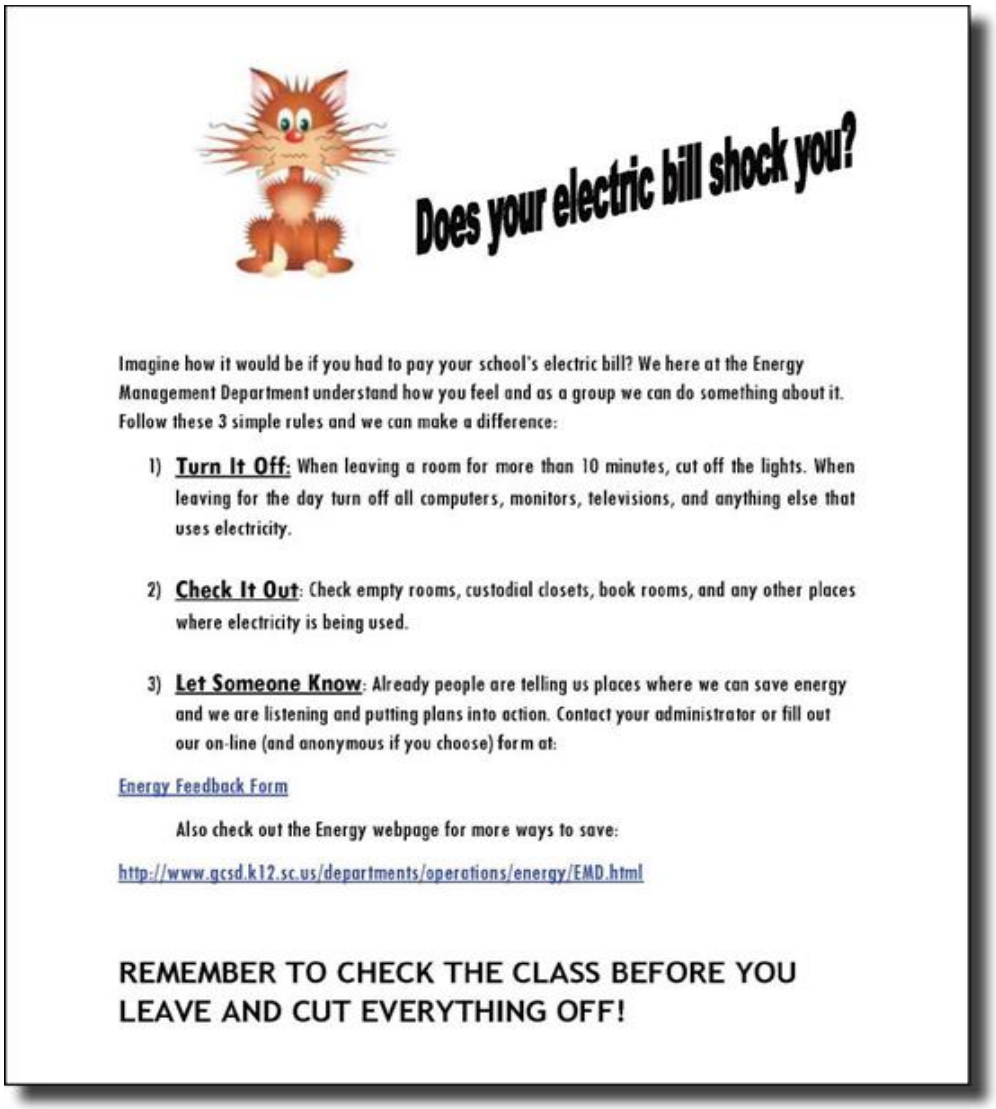
Georgetown School District
2018 Church Street
Georgetown, SC 29440
(843) 436-7000

Georgetown School District implemented behavioral cues which helped to reduce energy consumption by more than 1 million kBtus. The Energy Management Department upgraded the District's energy management system, replaced HVAC units, and implemented easy-to-follow "no cost" measures. Every Friday they sent a lighthearted "Weekly Reminder" through district e-mail to every faculty member as a reminder to turn off unnecessary equipment before leaving on Fridays and holidays. They also encouraged staff to report any areas where they felt energy could be saved and created an online form that could be filled out and submitted to the District Energy Management Department. The energy management system also allowed the District to track and compare energy savings at each school, creating friendly competition between local schools.



Does your electric bill shock you?

Imagine how it would be if you had to pay your school's electric bill? We here at the Energy Management Department understand how you feel and as a group we can do something about it. Follow these 3 simple rules and we can make a difference:

1) **Turn It Off:** When leaving a room for more than 10 minutes, cut off the lights. When leaving for the day turn off all computers, monitors, televisions, and anything else that uses electricity.

2) **Check It Out**: Check empty rooms, custodial closets, book rooms, and any other places where electricity is being used.

3) **Let Someone Know**: Already people are telling us places where we can save energy and we are listening and putting plans into action. Contact your administrator or fill out our on-line (and anonymous if you choose) form at:

Energy Feedback Form

Also check out the Energy webpage for more ways to save:

http://www.gcsd.k12.sc.us/departments/operations/energy/EMD.html

REMEMBER TO CHECK THE CLASS BEFORE YOU LEAVE AND CUT EVERYTHING OFF!

South Carolina School Success Stories

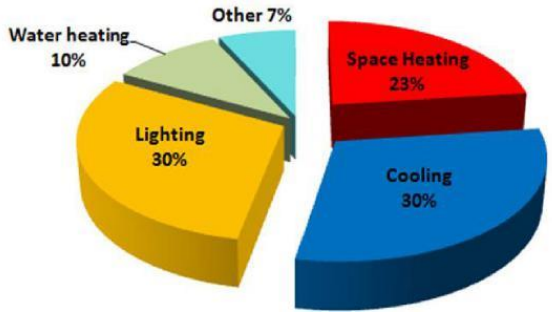
Lighting

Lighting can be a significant expense for school districts. The commercial energy sector, which includes institutional buildings, consumed about 275 billion kWh for Lighting or 21 percent of commercial sector electricity consumption in 2011. Public schools spend more than $6 billion dollars annually on energy. Nationwide, as much as 30 percent of that energy use is the result of inefficiency. By installing energy efficient lighting systems, districts can begin to cut their energy costs while improving light quality in classrooms and reducing heat gain. Remember to check with your local utility to see if additional rebates are available.

As part of the American Reinvestment and Recovery Act (ARRA), school districts across South Carolina replaced inefficient lightbulbs in classrooms and gymnasiums to improve energy usage. Funding allowed more than 70 schools to upgrade to energy efficient lighting; the bulk of upgrades involved the replacement of T12 fluorescent bulbs with the more efficient T8 bulbs. A T8 bulb can provide the same quality of light while drawing less power making the T8 a more energy-efficient bulb to use. In addition to lightbulb upgrades, districts also added motion sensors to lessen energy usage when classrooms and buildings were unoccupied. See project examples on the back of this handout.

Typical Energy Usage in Facilities

Courtesy U.S. Department of Energy



- The average school building in the United States is more than forty years old. Older buildings were not designed to meet the energy needs of today's students.
- K-12 schools use, on average, 10 kWh of electricity per square foot per year.
- A mid-sized school district with 800,000 square feet of building space spends more than $1 million annually for energy.
- According to the National Center for Education Statistics, per student energy expenditure rose 19% from 2007-2008.
- Lighting, cooling, and plug loads are the top three energy uses for school buildings.

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Fairfield County School District
1226 US Highway 321 By-Pass South
Winnsboro, SC 29180
(803) 635-4607

Project Title: Lighting Replacement and Upgrades

Project Cost: $172,246

Lifetime Savings: $719,877

Projected Payback Period: 4.9 years

Project Description: At Fairfield Central High School, the District replaced existing T12 lamps with T8 lamps, upgraded magnetic ballasts to electronic ballasts, and installed dual sensor dual switching occupancy sensors.

Horry County School District
335 Four Mile Rd (PO Box 26005)
Conway, SC 29528
(843) 488-6700

Project Title: Occupancy Sensor Installation

Project Cost: $598,438

Lifetime Savings: $2,895,882

Projected Payback Period: 1.9 years

Project Description: The District installed district-wide (in 49 schools) ceiling mount occupancy sensors.

Jasper County School District
10942 North Jacob Smart Blvd. (PO Box 848)
Ridgeland, SC 29936
(843) 717-1100

Project Title: Lighting Installation and Tree Planting

Project Cost: $87,790.00

Lifetime Savings: $1,704,828

Projected Payback Period: 1.4 years

Project Description: The District replaced metal halide lamps, installed magnetic contact switches, and installed light sensors. The District also planted deciduous shade trees to aid in building cooling.

Laurens County School District 55
1029 West Main St.
Laurens, SC 29360
(864) 984-3568

Project Title: Energy Performance Contract to Reduce Energy Consumption

Project Cost: $136,377.00

Lifetime Savings: $7,582,460

Projected Payback Period: 0.4 years

Project Description: The District established an Energy Performance Contract to reduce energy consumption by 15%, which included five energy measures for improvements in lighting, sensors, mechanical (buildings), control systems, windows, and doors.

Aiken County School District
1000 Brookhaven Dr.
Aiken, SC 29803
(803) 641-2428

Project Title: Extensive Lighting and Electrical Upgrades

Project Cost: $584,513.00

Lifetime Savings: $1,782,212

Projected Payback Period: 8.1 years

Project Description: The district conducted 24 energy measures for lighting and electrical upgrades district wide.

Dorchester County School District 4
500 Ridge St.
St. George, SC 29477
(843) 563-4535

Project Title: Lighting Retrofit

Project Cost: $97,784.00

Lifetime Savings: $608,194

Projected Payback Period: 3.9 years

Project Description: The district conducted a lighting retrofit for St. George Middle School.

South Carolina School Success Stories

Energy Management Systems

An Energy Management System allows an organization to centrally monitor and control devices like HVAC units and lighting systems across multiple locations, Monitoring data from an energy management system allows facility and building managers to improve energy performance and efficiency. An Energy Management System may include Direct Digital Controls, which typically have analog and digital inputs that allow measurement of a variable (temperature, humidity, or pressure) and analog and digital outputs for control of a medium (hot/cold water and/or steam). Remember to check with your local utility to see if rebates are available for energy efficiency upgrades.

As part of the American Reinvestment and Recovery Act (ARRA), school districts across South Carolina installed Energy Management Systems and/or Direct Digital Controls to better monitor temperature, lighting, and energy usage. Thermostats with motion sensors were installed in many locations to prevent the HVAC units from running when classrooms are unoccupied. Thermostats with temperature controls that only allow for a ten degree temperature variance were also installed. Through the use of Energy Management Systems and Direct Digital Controls, districts can show real-time energy usage data for each school and generate comparison data between different schools, thereby enhancing existing energy saving efforts. Educational displays and animations included in many of the programs show numerous techniques for reducing energy use. See project examples on the back of this handout.

Sumter County Schools (top left) installed Direct Digital Controls on HVAC systems in their schools and linked them to an Energy Management System. By controlling energy usage and temperature in their schools, they are saving $48,000 a year ($976,000 over the life of the system). The school district received a rebate check from Progress Energy for $96,076 as part of their *Energy Efficiency for Business* program.

Horry County Schools (bottom left) installed occupancy sensors in their schools to prevent lights and systems from running in areas where there were no students or staff members. After installing more than 1600 sensors, they are saving $289,000 per year in energy costs (nearly $3 million over the life of the system). The Horry County School District received a check from Santee Cooper for $93,400 as part of their *Reduce the Use South Carolina* program.

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Abbeville County School District
400 Greenville Street, Abbeville, SC 29620
Phone: (864) 366-5427

Project Title: Direct Digital Energy Management HVAC Control System

Project Cost: $120, 882

Lifetime Savings: $632,493

Payback Period: 3.1 years

Project Overview: The District installed automated Direct Digital Controls, which control thirteen split system HVAC units at both Diamond Hill Elementary School and Cherokee Trail Elementary School.

Dillon County School District 2
405 West Washington Street, Dillon, SC 29536
Phone: (843) 774-1200

Project Title: Installation of Direct Digital Controls at Stewarts Elementary School

Project Cost: $80,000

Lifetime Savings: $273,335

Payback Period: 5.9 years

Project Overview: The District added Stewart Heights Elementary School to the district's Direct Digital Control system. The controls were installed on thirty-five wall-hung HVAC units and fifteen rooftop HVAC units.

Georgetown County School District
2018 Church Street, Georgetown, SC 29440
Phone: (843) 436-7000

Project Title: Energy Management System installation & HVAC upgrades

Project Cost: $348,752

Lifetime Savings: $1,656,754

Payback Period: 5.2 years

Project Overview: The District installed an Energy Management System on sixty-eight HVAC units at Waccamaw Elementary School and Waccamaw High School. The District also replaced twenty-one HVAC units at Pleasant Hill Elementary School with fifteen new SEER HVAC units. The non-programmable thermostats at the school were replaced with seven-day programmable controls.

York County School District 3
660 N. Anderson Road, Rock Hill, SC 29730
Phone: (803) 981-1000

Project Title: Energy Conservation Measures for York School District 3, Rock Hill Schools

Project Cost: $471,000

Lifetime Savings: $3,248,474

Payback Period: 3.5 years

Project Overview: The District re-commissioned Direct Digital controls on three buildings and installed them in another building. In one school, the electric duct heaters were replaced with a hot water boiler. In another school, the variable frequency drives were replaced on the central hot water pump.

Richland School District 1
201 Park Street, Columbia, SC 29201
Phone: (803-231-7000

Project Title: Direct Digital Control Installation & Energy Management System updates

Project Cost: $921,962

Lifetime Savings: $4,551,580

Payback Period: 4.9 years

Project Overview: The District installed Direct Digital Controls on HVAC units at AC Flora High School. The district also implemented upgrades on HVAC unit controls at nine schools to link them into an updated Energy Management System.

Sumter County School District
1345 Wilson Hall Road, Sumter, SC 29150
Phone: (803) 469-3769

Project Title: Energy Management System for HVAC

Project Cost: $241,757

Lifetime Savings: $976,527

Payback Period: 4.1 years

Project Overview: The District installed Direct Digital Controls in Bates Middle School. The district-wide Ethernet system was re-networked to include ten additional schools and temperature control systems were re-commissioned in five schools.

Case Study
HVAC

ConserFund Loans

The ConserFund Loan program was established by the South Carolina Energy Office to assist government and non-profit entities in carrying out energy efficiency projects.

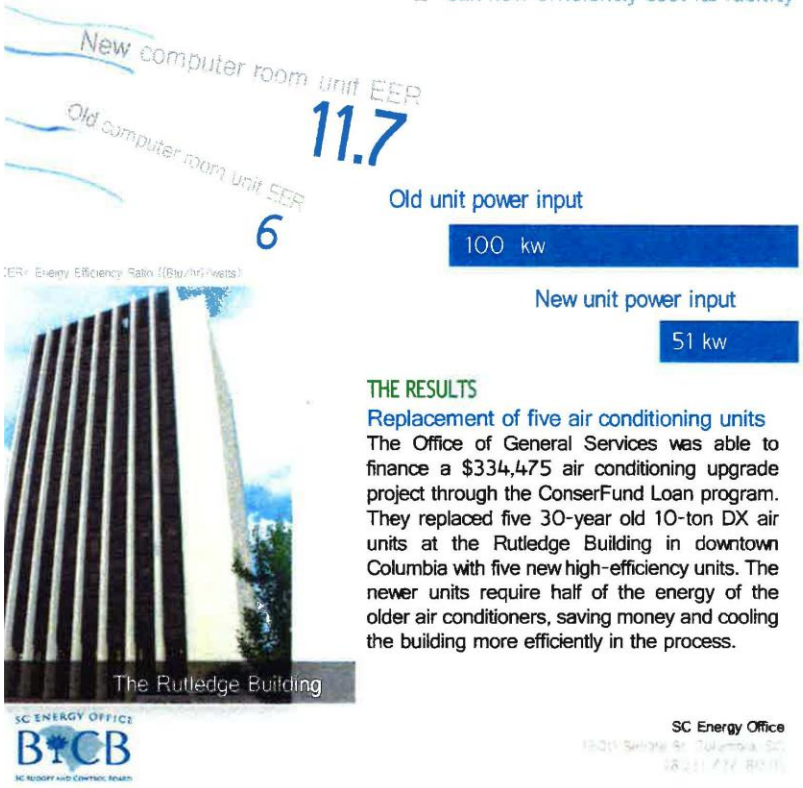
The Rutledge Building

Columbia, SC

The Rutledge Building is a 14-floor office building in downtown Columbia, SC. It houses the South Carolina State Department of Education.

RESULTS AT A GLANCE

- SAVINGS of $20,805 per year
- Loan return of 16 years
- Can now efficiently cool its facility



The Rutledge Building

THE RESULTS

Replacement of five air conditioning units

The Office of General Services was able to finance a $334,475 air conditioning upgrade project through the ConserFund Loan program. They replaced five 30-year old 10-ton DX air units at the Rutledge Building in downtown Columbia with five new high-efficiency units. The newer units require half of the energy of the older air conditioners, saving money and cooling the building more efficiently in the process.

SC Energy Office

Case Study
Lighting

ConserFund Loans

The ConserFund Loan program was established by the South Carolina Energy Office to assist government and non-profit entities in carrying out energy efficiency projects.

The Brown Building

Columbia, SC

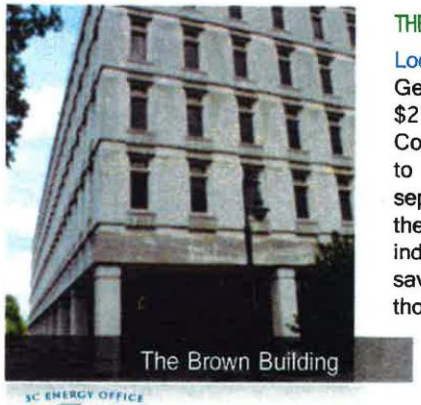
The Brown Building is one of several state office buildings on the South Carolina State House Complex. Built in the early 1970s, the Brown Building houses a variety of state offices.

RESULTS AT A GLANCE

- SAVINGS of $5,492.50 per year
- Loan return of 4.97 years
- Can now turn off lights independently of one another

Loan
$27,302.50

Return
4.97 years


The Brown Building

THE RESULTS

Localized switching of light fixtures

General Services was able to finance a $27,302.50 loan through the ConserFund Program. They were able to modify the building's lighting to separate the light switch that controlled the hallway and several offices, into individual office lighting controls, saving hours of energy usage and thousands of energy dollars.

SC Energy Office

Case Study

Lighting Upgrades
Water Conservation
Chiller Replacement

Performance Contracting

Performance contracting allows government-owned facility operators to finance renovations and improvements based on guaranteed future utility and operational savings.

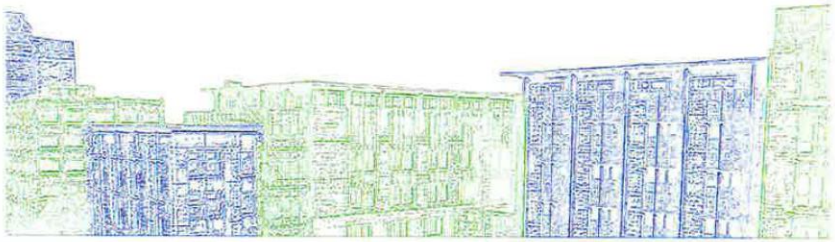
Medical University of SC

Charleston, SC

Serving the citizens of South Carolina since 1824, MUSC has expanded from a small private college to a state university with a medical center and six colleges for the education of a broad range of health related personnel.

RESULTS AT A GLANCE

- SAVINGS of $2,469,442 per year
- Payback of 5.8 years



THE RESULTS

Energy Retrofits with Guaranteed Savings

MUSC chose to enter into a performance contract to replace aging or inoperable energy infrastructure and to improve the efficiency of systems at several facilities. This included lighting upgrades and controls at numerous buildings, water conservation measures, boiler controls, energy management systems, upgrading fume hoods in a lab, adding/replacing chillers, and refurbishing of fans. The initial investment for the project was $14,499,337. The guaranteed savings for the first year was $2,469,442. The project is expected to have a payback period of 5.8 years based on the measured and expected savings.

SC ENERGY OFFICE
BCB
SC Budget and Control Board

SC Energy Office
1200 Senate St. Columbia, SC
(803) 737-8030

Case Study

Electricity

USC Beaufort

Beaufort, SC

The Hargray Building at USCB is a 59,649-square-foot facility completed in 2004, and is the signature building on the Bluffton campus; the facility houses the USCB Chancellor, Administration and Support Offices, Classrooms and Meeting Rooms.

RESULTS AT A GLANCE

- SAVINGS of $16,500 per year
- Payback of 1.5 years

THE RESULTS

Electricity Upgrades

Before the retrofits, the Hargray Building had high-energy usage and costs that were twenty percent over the designed target, and the utility bills kept increasing. Not only were they dealing with high electricity bills, but were receiving frequent building user complaints about the indoor environment.


Hargray Building, USC Beaufort

USCB was able to upgrade the existing building envelope and HVAC and electrical power and lighting systems to improve building operating efficiencies, reducing energy consumption and improving occupant comfort. With a payback of 1.5 years, USCB sees an annual savings of $16,500 with the electricity retrofits, showing that savinggs are worth the investment.

SC ENERGY OFFICE
BCB
SC Budget and Control Board

SC Energy Office
1200 Senate St. Columbia, SC
(803) 737-8030

Appendix B: List of Organizations Not Submitting Reports

At the time this annual report was written, the following entities had not submitted any reports:

Bamberg County School District 2
Clarendon County School District 3
Dorchester County School District 2
Florence County School District 4
Saluda County School District

At the time this annual report was written, the following entities had submitted partially complete reports:

SC Public Railways
School for the Deaf & the Blind, SC
Dillon School District 4
Florence School District 5
Hampton School District 2
Jasper School District
Lancaster School District
Laurens School District 55
Lexington School District 3
Marion School District
Marlboro School District
Spartanburg School District 1
Spartanburg School District 3
Sumter School District
Union School District
Williamsburg School District
York School District 4

Appendix C

Sample 2014 Annual Progress Reports

Horry County School District
SC Military Department
University of South Carolina-Aiken
Greenville Technical College

Organization Name:

Horry County Schools

Person(s) Filing Report (name, phone number, email):

Greg Sponseller, (843) 488-6721, gsponseller@horrycountyschools.net

Please complete this report and return it to Julia Parris at the South Carolina Energy Office (jparris@energy.sc.gov) no later than August 29th, 2014. Sections I, III, IV, V and VI may be completed using either this form or a different format of your choosing. Completion of Section II requires the submission of energy consumption data, as described below.

This report will allow the South Carolina Energy Office to verify your compliance with the State Government Energy Conservation Act (§48-52-610 through 680 and §48-52-910, Code of Laws of South Carolina). In addition, the energy consumption data you provide will be made available to assist in statewide energy planning efforts. Please ensure that your submission is as complete and accurate as possible. If you need additional space, please attach pages or documents as necessary. If you have questions, please contact Julia Parris at 803-737-8030 or jparris@energy.sc.gov.

Section I: Energy Conservation Measures

§48-52-820 requires entities to report activities undertaken to implement their Energy Conservation Plan. For this section, please list each energy conservation measure that you implemented in FY14. For each measure, please include the following:

1. A description of the energy conservation measure implemented including an estimate of square footage affected.
2. The estimated and/or observed annual energy savings (if available) and estimation method (if applicable.).

If you implemented no energy conservation measures in FY14, simply write "None."

Green Sea Floyds Elementary HVAC renovation project: 45 classroom split system hvac units receive complete replacement with minimum 15 SEER replacement equipment. Original construction and equipment installation was completed in 1991. These new units are a minimum of 25% more energy efficient than the original. This renovation project began in FY14, will be complete by 1/15/15. In addition to new HVAC equipment, additional controls were added for space CO2 and relative humidity control. Total square footage affected: approximately 35,000 SF.

To verify progress made toward state energy conservation goals and to assist in statewide energy planning efforts, please provide your complete energy consumption data for FY14 (including all sources of energy used in your buildings) in a format described below:

- *If you use Utility Direct, please ensure that all energy data for FY14 is fully entered and complete. We will access your data directly.*
- *If you use energy accounting software other than Utility Direct, please submit a file containing data showing energy consumption, energy cost, and gross square footage in FY14:*
  - *As totals for your organization*
  - *If available, for each meter and/or each building in your organization*
- *If you do not use any energy accounting software:*
  - *You may choose to complete and submit the file entitled "SCEO Consumption Reporting Tool", which can be downloaded from our website (please click here).*
  - *You might also want to consider using Portfolio Manager, the free, web-based energy accounting system provided by ENERGY STAR. To access Portfolio Manager, please click here.*

Section III: Energy Team Development

As part of your Energy Conservation Plan submitted to the South Carolina Energy Office, you were asked to form and list the members of your Energy Team. Please list or discuss all Energy Team training, education, or other development activities conducted in FY14. (If not applicable, simply write "None".)

Members of Energy Team:
Greg Sponseller, Sustainability Analyst
Dennis McCrary, Engineering Manager

Horry County Schools Facilities Department underwent widespread restructuring during the last year in order to better align departments, define roles and responsibilities, and increase communication. This restructuring called for the hiring of several new individuals who will play a role in energy management and conservation. Specifically, Greg Sponseller and Dennis McCrary have been charged with overseeing building control management systems and the Design, Engineering, and Sustainability Department is further investigating and implementing building retrofits and whole building architecture design that makes the efficient and effective use of energy a top priority.

Section IV: Purchase of Energy Conservation Products

§48-52-640 mandates that all state agencies "shall submit a disclaimer statement to the State Energy Office with [their] annual report stating that [they] did not purchase an energy conservation product that had not been certified by the State Energy Office." The Energy Office has posted a list of pre-certified and/or approved energy conservation products/measures on our website (please click here). For any products/measures not listed here, agencies should contact Tom Hudkins at thudkins@energy.sc.gov or by telephone at 803-737-8030

Statement	Initials
I hereby certify that my organization did not purchase any energy conservation products that have not been certified and/or approved by the South Carolina Energy Office.	GMS

Section V: Energy Retrofit Financing

*Did you enter into a performance contract in Fiscal Year 2014? Yes or **No** (Circle one)*

If so, please indicate the ESCO or company used:

*Have you used a performance contract in prior years? Yes or **No** (Circle one)*

If so, please indicate the ESCO or company used: **N/A**

*Are you interested in receiving information about the ConserFund loan program, ConserFund Plus (an expansion of ConserFund that includes a 30% grant/70% loan option) and/or performance contracting? **Yes** No (Circle one)*

SCEO has established the Palmetto Energy Efficient Retrofits (PEER) program through a US Department of Energy competitive grant. This year we are able to offer consulting services to assist with needs assessment and arranging financing options for energy efficiency projects. Please contact George Kokolis or Trish Jerman at 803-737-8030 if you are interested in learning more about the program.

Section VI: Additional Narrative

Please provide a brief write-up addressing any changes that may have occurred since submission of your Energy Conservation Plan to the South Carolina Energy Office, as well as any successes deserving mention, or barriers to improvement that you have faced. (If not applicable, simply write "None".)

New employee additions:
Greg Sponseller, Sustainability Analyst
Dennis McCrary, Engineering Manager

New building design and renovation: Two new high schools and one elementary school addition were completed during FY14 and designed and constructed using LEED certification guidelines.
Loris Elementary Expansion
Early College High
Scholars Academy

Several Horry County schools received EPA's Energy Star certification:
Aynor Middle School
Palmetto Bays Elementary
Ocean Bay Elementary
Ocean Bay Middle School
Conway Middle School

Future planning and strategy: Continued use of LEED design criteria in new building construction and retrofit work.

Organization Name:

SC Military Department

Person(s) Filing Report (name, phone number, email):

Whitney Hutto, (803) 299-4286, huttow@tag.scmd.state.sc.us

Please complete this report and return it to Julia Parris at the South Carolina Energy Office (jparris@energy.sc.gov) no later than August 29th, 2014. Sections I, III, IV, V and VI may be completed using either this form or a different format of your choosing. Completion of Section II requires the submission of energy consumption data, as described below.

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Section I: Energy Conservation Measures

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3. A description of the energy conservation measure implemented including an estimate of square footage affected.
4. The estimated and/or observed annual energy savings (if available) and estimation method (if applicable.).

If you implemented no energy conservation measures in FY14, simply write "None."

Columbia Armory:

HVAC upgrade and control installation (63,739 SF):

- Project Cost: $200,000
- Estimated Annual Energy Savings: 348.91 MMBtu
- Estimated Annual Cost Savings: $12,271
- Simple Payback Period: 16.30, SIR: 1.13

Energy Projects (continued)

West Columbia Armory:

Lighting Upgrade (27,359 SF):

- Project Cost: $8,300
- Estimated Annual Energy Savings: 116.59 MMBtu
- Estimated Annual Cost Savings: $4,100
- Simple Payback Period: 2.02, SIR: 9.06

Florence Armory:

HVAC Upgrade (25,647 SF):

- Project Cost: $82,058
- Estimated Annual Energy Savings: 203.91 MMBtu
- Estimated Annual Cost Savings: $7,171
- Simple Payback Period: 11.44, SIR: 1.6

Rock Hill Armory:

HVAC Upgrade (30,999 SF):

- Project Cost: $45,412
- Estimated Annual Energy Savings: 117.65 MMBtu
- Estimated Annual Cost Savings: $4,138
- Simple Payback Period: 10.98, SIR: 1.67

Easley Armory:

Lighting Upgrade (18,003 SF):

- Project Cost: $17,000
- Estimated Annual Energy Savings: 46.30 MMBtu
- Estimated Annual Cost Savings: $2,253
- Simple Payback Period: 7.50, SIR: 1.1

Section II: Energy Consumption Data

To verify progress made toward state energy conservation goals and to assist in statewide energy planning efforts, please provide your complete energy consumption data for FY14 (including all sources of energy used in your buildings) in a format described below:

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Whitney Hutto, Energy Manager, completed the SC Accredited Commercial Energy Manager course

Section IV: Purchase of Energy Conservation Products

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Statement	Initials
I hereby certify that my organization did not purchase any energy conservation products that have not been certified and/or approved by the South Carolina Energy Office.	WCH

Section V: Energy Retrofit Financing

Did you enter into a performance contract in Fiscal Year 2014? Yes or No (Circle one)

If so, please indicate the ESCO or company used: **NO**

Have you used a performance contract in prior years? **NO**

If so, please indicate the ESCO or company used:

Are you interested in receiving information about the ConserFund loan program, ConserFund Plus (an expansion of ConserFund that includes a 30% grant/70% loan option) and/or performance contracting? **Yes**

Section VI: Additional Narrative

Please provide a brief write-up addressing any changes that may have occurred since submission of your Energy Conservation Plan to the South Carolina Energy Office, as well as any successes deserving mention, or barriers to improvement that you have faced. (If not applicable, simply write "None".)

The Energy Conservation Plan is currently undergoing significant revision to ensure compliance with the broadest range of state, federal, and military regulations and drivers. A draft of this plan should be available by the end of Federal Fiscal Year 2014 (September 30, 2014). All other energy conservation strategies addressed in the original submission of our Energy Conservation Plan remain in progress.

The South Carolina Army National Guard (SCARNG) has made a concerted effort over the past fiscal year to take advantage of utility company rebates when replacing old equipment and installing new equipment. These rebates have helped to offset some cost and increased our ability to fund certain projects.

Unfortunately, a continued lack of state funding makes it difficult to execute energy conservation projects that can help affect a reduction in energy consumption. While federal funds are more readily available, projects cannot be executed without matching state funds. Therefore we are unable to implement many identified energy efficiency measures.

In addition, increased operations tempo (deployments) continues to place a strain on our ability to effectively reduce our energy use. However, the South Carolina Army National Guard remains committed to energy conservation and is continually evaluating areas in which it can reduce its energy footprint in spite of the high demands of training and deployment schedules.

Organization Name:

University of SC Aiken

Person(s) Filing Report (name, phone number, email):

Leonard Engel, 803-641-3538, lene@usca.edu

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6. The estimated and/or observed annual energy savings (if available) and estimation method (if applicable.).

If you implemented no energy conservation measures in FY14, simply write "None."

- Completed electric usage metering for individual buildings included on the SCE&G meter "main campus." This affects 516,320 sq ft. and enables "peak load" management and the ability to set individual building goals for usage reduction. At least a 2% annual reduction of "main campus" is expected.
- Completed planning for solar renewable energy (photovoltaic cells) for Science building and Ruth Patrick Science Education Center roofing. During summer this should significantly reduce kWh usage. This also affects "main campus" usage 516, 320 sq ft.
- Our campus went to half day Friday during summer to help reduce usage.

To verify progress made toward state energy conservation goals and to assist in statewide energy planning efforts, please provide your complete energy consumption data for FY14 (including all sources of energy used in your buildings) in a format described below:

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Section III: Energy Team Development

As part of your Energy Conservation Plan submitted to the South Carolina Energy Office, you were asked to form and list the members of your Energy Team. Please list or discuss all Energy Team training, education, or other development activities conducted in FY14. (If not applicable, simply write "None".)

The energy team consists of Senior University Facilities Executive Brian Enter, Environmental Health & Safety Manager Len Engel, Director of Physical Plant John Cumbee, HVAC Specialist Bobby Nicholson and Administrative Asst. Annette Beeler. Different members of the team have:

- Participated in ASSHE webinars for energy efficiency
- Attended SCE&G large user seminar
- Participated in School Dude energy efficiency webinar
- SCE&G Michael Coleman met with Operations to discuss energy reduction options for FY 14.
- USCA Facilities Budget Analytics

Section IV: Purchase of Energy Conservation Products

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Statement	Initials
I hereby certify that my organization did not purchase any energy conservation products that have not been certified and/or approved by the South Carolina Energy Office.	**le**

Section V: Energy Retrofit Financing

*Did you enter into a performance contract in Fiscal Year 2014? Yes or **No** (Circle one)*

If so, please indicate the ESCO or company used:

*Have you used a performance contract in prior years? Yes or **No** (Circle one)*

If so, please indicate the ESCO or company used:

*Are you interested in receiving information about the ConserFund loan program, ConserFund Plus (an expansion of ConserFund that includes a 30% grant/70% loan option) and/or performance contracting? **Yes** No (Circle one)*

SCEO has established the Palmetto Energy Efficient Retrofits (PEER) program through a US Department of Energy competitive grant. This year we are able to offer consulting services to assist with needs assessment and arranging financing options for energy efficiency projects. Please contact George Kokolis or Trish Jerman at 803-737-8030 if you are interested in learning more about the program.

Section VI: Additional Narrative

Please provide a brief write-up addressing any changes that may have occurred since submission of your Energy Conservation Plan to the South Carolina Energy Office, as well as any successes deserving mention, or barriers to improvement that you have faced. (If not applicable, simply write "None".)

USCA has completed all of our old chiller replacements except for Sciences. With individual energy usage data we anticipate more precise energy management strategies with competition among dorms etc. Once building occupants realize how much it costs to raise or lower that thermostat a degree or two in their building, or to forget to turn off lights and computers, or use the building on weekends when they really don't need it, we should gain momentum for energy conservation.

The solar power collecting photovoltaic cells on roof tops and later the possibility of a "solar farm" should help us surpass our 20% reduction goal. Energy conservation will be significant. Our focus is to rely more and more on "renewable" energy sources.

Organization Name:

Greenville Technical College

Person(s) Filing Report (name, phone number, email):

Ted Westervelt, (864) 250-8955

Section I: Energy Conservation Measures

No specific Energy Conservation Projects were implemented and there are no measured energy savings to report for FY14.

The following is a review of ongoing conservation efforts on items identified in the Greenville Technical College Energy Conservation Plan.

Lighting:
Efforts continue to replace all remaining T12 lighting. As areas are remodeled or updated lighting is upgraded to T8, T5, or LED.

IT Equipment:
As older equipment is replaced (PCs, monitors, printers, copiers) more efficient Energy Star rated equipment is used. Network management software is used to shutdown PCs in some labs and classrooms each evening.

Maintenance:
LED exit and emergency lighting fixtures used to replace failed incandescent fixtures. LED replacement lamps have been used where applicable to retrofit interior and exterior can lights when possible. High-efficiency motors and high SEER or Energy Star rated equipment is used or specified if possible when replacing failed HVAC equipment.

HVAC System Controls and Operations:
Primary HVAC systems are scheduled through BMS; schedules are adjusted weekly. Programmable stats continue to be installed on small units and auxiliary equipment

New Construction/Renovation:
Energy efficient T5 and LED lighting with occupancy sensor control was incorporated in design of renovated space for a new Learning Center on the Northwest Campus. Occupancy sensors will also be used to index the HAVC systems to “standby” mode when areas are not fully occupied.

Recycling:
All collected waste is sorted for recyclable materials to divert as much waste as possible from landfill. Paper collection bins are located in all office areas. Cardboard is collected and baled. Scrap metal bins are in place to for waste metal products, electrical/electronic items are collected separately as well.

Corrugated Cardboard	19.75 tons	Co-mingled recycling (paper/bottles/cans/etc.)	40.30 tons
Office Paper	38.83 tons	Electrical/Electronic Products	9.75 tons
Assorted Metals	4.44 tons	Used Cooking Oil	0.01 tons

Section II: Energy Consumption Data

Because of overlapping combined electrical and natural gas accounts and their associated square footage totals, our Utility Direct data as entered is not valid for reporting and comparing building energy usage and costs. The data used for Section II of the FY 14 Annual Progress Report was compiled from our own records and annual usage and cost data maintained in Excel worksheets for each of our electric and natural gas accounts.

Section III: Energy Team Development

As part of your Energy Conservation Plan submitted to the South Carolina Energy Office, you were asked to form and list the members of your Energy Team. Please list or discuss all Energy Team training, education, or other development activities conducted in FY14. (If not applicable, simply write "None".)

The current Greenville Technical College Energy Team did not meet in FY 2014. No progress was made towards the development of an Energy Policy. Some members of the Energy Team have continued to attend various energy workshops, training sessions, and information exchanges sponsored by State Associations, local vendors, contractors, and utility suppliers.

Many members of the current team have assumed deferent role roles with the College. It has become evident that a new Energy Team needs to be formed if the College is to move forward with the development of a comprehensive policy that can be endorsed by faculty, staff, and college administration.

Section IV: Purchase of Energy Conservation Products

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Statement	Initials
I hereby certify that my organization did not purchase any energy conservation products that have not been certified and/or approved by the South Carolina Energy Office.	***TRW***

Section V: Energy Retrofit Financing

Did you enter into a performance contract in Fiscal Year 2014? ***(No)***

If so, please indicate the ESCO or company used:

Have you used a performance contract in prior years? ***(No)***

If so, please indicate the ESCO or company used:

Are you interested in receiving information about the ConserFund loan program, ConserFund Plus (an expansion of ConserFund that includes a 30% grant/70% loan option) and/or performance contracting? ***(Yes)***

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Section VI: Additional Narrative

Please provide a brief write-up addressing any changes that may have occurred since submission of your Energy Conservation Plan to the South Carolina Energy Office, as well as any successes deserving mention, or barriers to improvement that you have faced. (If not applicable, simply write "None".)

Although the College did not undertake any specific energy conservation projects or implement any additional energy conservation measures it was hoped that our energy usage would continue its downward trend. Unfortunately, there is no reduction in energy consumption to report for FY14. Consumption data indicates an overall increase of 2.2% and 3.7% increase in energy intensity (kBTU/sq ft) for heated/cooled building spaces.

Analysis of FY14 consumption data reveals that nearly all of the 3.7% increase in energy intensity can be attributed to the winter months (Nov - Feb). Consumption during that four month period increased by over 10%. That 10% increase in energy usage during the winter months accounts for nearly all of the 3.7% increase in energy intensity reported for all of FY14.

This increase in consumption was distinctly evident on the Barton Campus where an increase of 14% in kBTU/sq ft was noted in some buildings. This increase was due to the unusually cold temperatures experienced in the Upstate during those winter months combined with the poor building envelope condition of many of the older buildings on that campus.

Cold winter temperatures result in outdoor-to-indoor ΔT's of more than twice the typical outdoor-to-indoor ΔT's experienced in even the warmest summer months. Poor building envelope conditions required that some building HVAC systems remained in operation 24/7 to maintain building conditions and prevent damage from frozen water and sprinkler system lines.